

REMARKS

Claims 1 through 20 remain pending in the application. Claims 1 and 10 through 18 have been amended to even more succinctly define the invention and/or to improve their form. Claim 1 is the only independent claim present in the application.

The Examiner has made a two-way election of species requirement alleging that there are two patentably distinct species of the claimed invention, i.e. (1) an optical scanning apparatus comprising light source means for providing a single light beam (Claims 1 through 9, 19/(1-9), and 20/(1-9); and (2) a multi-beam optical scanning apparatus comprising light source means for providing a plurality of light beams (Claims 10 through 18, 19/(10-18), and 20/(10-18).

Initially, it is noted that Claims 1 and 10 through 18 have been amended so that all of the claims now recite an optical scanning apparatus. No claims are now directed to a multi-beam optical scanning apparatus. Accordingly, it is respectfully submitted that the amended claims constitute a single species and the restriction requirement should be withdrawn. Further, Applicant submits that Claim 1 is generic to all claims as a result of the foregoing amendments and that prosecution on the merits of all claims is in order. Accordingly, neither Applicant nor the Patent and Trademark Office should be put to the trouble and expense entailed in multiple filings and prosecution. Moreover, it is respectfully submitted that the public at large should not be required to obtain and study several patent documents in order to have available all of the issued patent claims covering the invention. Accordingly, the Examiner is kindly requested to reconsider and withdraw the election of species argument.

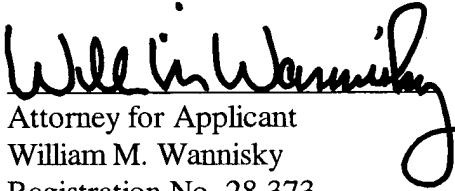
Nevertheless, in order to comply with the requirements of 37 CFR 1.143, Applicant provisionally elects Species I, Claims 1 through 9, 19/(1-9), and 20/(1-9).

Application directs the Examiner's attention to page 39, line 15, et. seq. of the specification wherein particular aspects of the invention recited in Claim 1 relating to enabling the spot size in the subscanning direction to be kept uniform entirely over the effective scanning area on the surface to be scanned are discussed.

Favorable consideration hereof and early passage to issue of the present application are earnestly solicited.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,


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VERSION WITH MARKINGS SHOWING CHANGES MADE TO CLAIMS

1. (Amended) An optical scanning apparatus comprising entrance optical means for guiding light emitted from light source means, to deflecting means, and scanning optical means for forming an image of [focusing] the light reflectively deflected by the deflecting means, on a surface to be scanned,

wherein the scanning optical means comprises a plurality of sagittal asymmetric change surfaces in which curvatures in the sagittal direction change on an asymmetric basis in the meridional direction with respect to the optical axis of the scanning optical means.

10. (Amended) The optical scanning apparatus according to Claim 1,
wherein said light source means includes a plurality of light-emitting regions for emitting a
plurality of beams and the plurality of beams are guided from said light source means to
said deflecting means by said entrance optical means and images of the beams reflectively
deflected by said deflecting means are formed on a surface to be scanned by said scanning
optical means [A multi-beam optical scanning apparatus comprising light source means having a plurality of light-emitting regions, entrance optical means for guiding a plurality of beams emitted from the light source means, to deflecting means, and scanning optical means for focusing the plurality of beams reflectively deflected by the deflecting means, on a surface to be scanned,

wherein said scanning optical means comprises a plurality of sagittal asymmetric change surfaces in which curvatures in the sagittal direction change on an asymmetric basis in the meridional direction with respect to the optical axis of the scanning optical means].

11. (Amended) The [multi-beam] optical scanning apparatus according to Claim 10, wherein said sagittal asymmetric change surfaces comprise two or more sagittal modification surfaces in which magnitude relation differs among curvatures in the sagittal direction at respective positions in the meridional direction with respect to the optical axis.

12. (Amended) The [multi-beam] optical scanning apparatus according to Claim 11, wherein said sagittal deformation surfaces comprise two or more surfaces in which the curvatures in the sagittal direction at the respective positions in the meridional direction with respect to the optical axis become large or small on the same side.

13. (Amended) The [multi-beam] optical scanning apparatus according to Claim 11, wherein in at least one surface of said sagittal deformation surfaces the curvatures in the sagittal direction become large on the side of said light source means with respect to the optical axis.

14. (Amended) The [multi-beam] optical scanning apparatus according to Claim 10, wherein in at least one surface of said sagittal asymmetric change surfaces the curvatures in the sagittal direction have an inflection point only on one side in the meridional direction with respect to the optical axis.

15. (Amended) The [multi-beam] optical scanning apparatus according to Claim 10, wherein said scanning optical means comprises a plurality of $f\theta$ lenses, an $f\theta$ lens located closest to the deflecting means out of said plurality of $f\theta$ lenses has a negative, refractive power in the sub-scanning direction, and an $f\theta$ lens located closest to the surface to be scanned has a positive, refractive power in the sub-scanning direction.

16. (Amended) The [multi-beam] optical scanning apparatus according to Claim 15, wherein all lens surfaces of said plurality of $f\theta$ lenses are formed in a concave shape opposed to said deflecting means.

17. (Amended) The [multi-beam] optical scanning apparatus according to Claim 10, wherein the following condition is satisfied:

$$k/W \leq 0.6$$

where k is an $f\theta$ coefficient of said scanning optical means and W an effective scanning width on said surface to be scanned.

18. (Amended) The [multi-beam] optical scanning apparatus according to Claim 10, wherein the following condition is satisfied:

$$|\beta_s| \geq 2$$

where β_s is a lateral magnification in the sub-scanning direction of said scanning optical means.